

IN THE DRAWINGS

The attached sheet of drawings includes changes to Figs. 6, and 8(a) – 8(c). This sheet, which includes Figs. 6, and 8(a) – 8(c), replaces the original sheet including Figs. 6, and 8(a) – 8(c).

Attachment: Replacement Sheets

REMARKS/ARGUMENTS

Favorable reconsideration of this application as currently amended and in light of the following discussion is respectfully requested.

Claims 1 and 3-24 are pending, Claim 2 having been canceled, Claims 3, 6, and 10-22 amended, and Claims 23 and 24 added by way of the present amendment.

In the outstanding Office Action, the Restriction Requirement was withdrawn; the figures were objected to; Claims 12 and 18 were objected to; Claim 1 was rejected as being anticipated by Kinoshita et al (U.S. 2002/0027703, hereinafter Kinoshita); Claims 2-6 and 8 were rejected as being unpatentable over Zhang et al (U.S. Patent No. 6,490,889, hereinafter Zhang); Claim 22 was rejected as being unpatentable over Tran (U.S. Patent No. 4,519,826); and Claims 7 and 9-21 were indicated as containing allowable subject matter.

Applicants appreciative acknowledge the identification of allowable subject matter.

In reply, Claim 2 has been canceled, Claim 3 amended, Claim 6 amended to depend from Claim 3, Claims 10-21 revised to be in allowable form, Claim 22 amended, and new Claims 23 and 24 added by way of the present amendment. Support for the amendment to Claim 3 is found in the present specification at least at page 14, lines 12-16, page 21, lines 14-17 and Table II of the present specification. Therefore, no new matter is added. New Claim 23 is directed to the combination of Claims 2, 6, and 7 and therefore no new matter is added. Similarly, Claim 24 includes the subject matter of original Claims 2, 6, 8, and 9, and therefore no new matter is added. Because Claims 7 and 9 were indicated as containing allowable subject matter, it is believed that Claims 23 and 24 are also allowable.

The drawings have been corrected as requested in the outstanding Office Action and Applicants submit replacement drawing sheets for Figures 6, and 8(a)-8(c).

Objections to Claims 12 and 18 have been addressed by way of the present amendment.

Applicants respectfully traverse the rejection of Claim 1. Claim 1 requires an optical fiber characterized by having a full width at half maximum of a gain spectrum to be 45 nm or more, and maximum value of power conversion efficiency as being 80% or more.

Comparing Claim 1 with Kinoshita, Figures 21 and 24 of Kinoshita are directed to the full width at half maximum of the absorption bands of Erbium doped fibers, not the amplification band (i.e., where a gain is applied to the optical signal). Claim 1 is directed to a full width at half maximum gain spectrum of being 45 nm or more. Obviously gain spectrum is the spectrum over which the optical signal is amplified. In contrast, Figures 21 and 24 of Kinoshita are directed to the absorption bands of the Erbium doped fibers and not the gain spectrum. Therefore, Kinoshita does not anticipate Claim 1.

Claim 3 has been amended to incorporate the subject matter of Claim 2. Claim 3 is directed to a method for manufacturing a rare earth element-doped glass for use in manufacturing an optical fiber. The method includes steps of depositing fine silica glass particles and immersing an aggregate of fine silica glass particles doped with a co-dopant. A total concentration of aluminum doped in the depositing step and the immersing step is not less than 1.5 mass %. An advantage with this approach for manufacturing a rare earth element-doped glass, is that it is possible to dope a large quantity of aluminum stably within the optical fiber. A benefit is that this allows for the fiber, when used in optical amplification, to have a high conversion efficiency.

Zhang provides a description regarding aluminum content, at column 24, lines 50-54. However, this description describes 0.65 mol % of  $\text{Al}_2\text{O}_3$  being contained in the fiber. Applicants assert that this percentage corresponds to 0.58 mass % in terms of Al and therefore this value in Zhang is outside of the claimed range in Claim 3 (not less than 1.5 mass %), and consequently no matter how Zhang is characterized, it would not render obvious the invention defined by amended Claim 3. Zhang, neither teaches nor suggests all

of the features of amended Claim 3, especially the feature regarding the concentration of aluminum being not less than 1.5 mass %. As Claims 4-6 and 8 depend from amended Claim 3, it is respectfully submitted that these claims patentably define over Zhang.

Claim 22 is rejected as being unpatentable over Tran. Claim 22 has been amended to describe a method having steps of forming a cladding layer on a core rod having a high concentration of an aluminum being clouded. The process also includes a step of centering the cladding layer in a glass rod with at least partially containing crystals. The process also includes a step of drawing the glass rod from making the optical fiber when the crystals are made to be transparent by the drawing process.

Tran describes crystallization as being a problem and tries to avoid crystallization at the time of drawing (see e.g., column 3, lines 57-59). Furthermore, Tran describes crystallization as being a problem and tries to avoid crystallization at the time of drawing (see e.g., column 3, lines 57-59). Furthermore, Tran does not provide a description that indicates a crystallization preform is drawn as claimed. Moreover, at page 22, lines 9-12 of the present specification it is explained that according to conventional wisdom a clouded portion should be removed when making a fiber for optical amplification. Therefore, Tran teaches away from the invention of Claim 22.

In the method according to the present invention, it is not necessary to remove cloudiness and crystallization from a preform. Moreover, a partially clouded and crystallized preform is purposely prepared, and the preform is drawn to be in a vitrified state. The presently claimed invention enables an optical fiber to be formed without bubbling even if a high concentration of aluminum is doped in the preform (see, e.g., specification at page 22, line 7 to page 24, line 17). Accordingly, it is respectfully submitted that Tran neither teaches nor suggests all of the features of Claim 22, and therefore, Claim 22 patentably defines over Tran.

Application No. 10/824,429  
Reply to Office Action of May 3, 2005

Consequently, in view of the present amendment and in light of the foregoing comments, it is respectfully submitted that the invention as presently claimed patentably defines over the asserted prior art. The present application is therefore believed to be in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.

Respectfully submitted,

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